



Drobot

The Ultimate Life Saving Drone



Introduction to Problem







Floods

- ◇ Climate change increases the risk of heavy rainfall
- ◇ Earth's most common—and most destructive—natural hazards
- ◇ More than \$40 billion in damage worldwide annually, according to the Organization for Economic Cooperation and Development
- ◇ More lives can be saved by rescuing earlier





Proposed Solution



Our process is easy



Send Drobot to the places affected by the flood

Identify the location, gender, age group of the victims

Provide clean basic amenities like food and water through drone

Based on collected data, regions are marked acc to priority

Saved location of the victims are inform to the authorities.





Sensors used in Drobot

Ultrasonic Sound Sensor

Used to detect obstacles using the principle of SONAR.

Sound Sensor

It is used to check sound of people / screams / claps which indicates a human presence.

Thermal Camera

Thermal camera is used to detect heat emitted from a source [here a human] and trigger a signal to the rescuers to indicate the presence of a victim.

Mapper

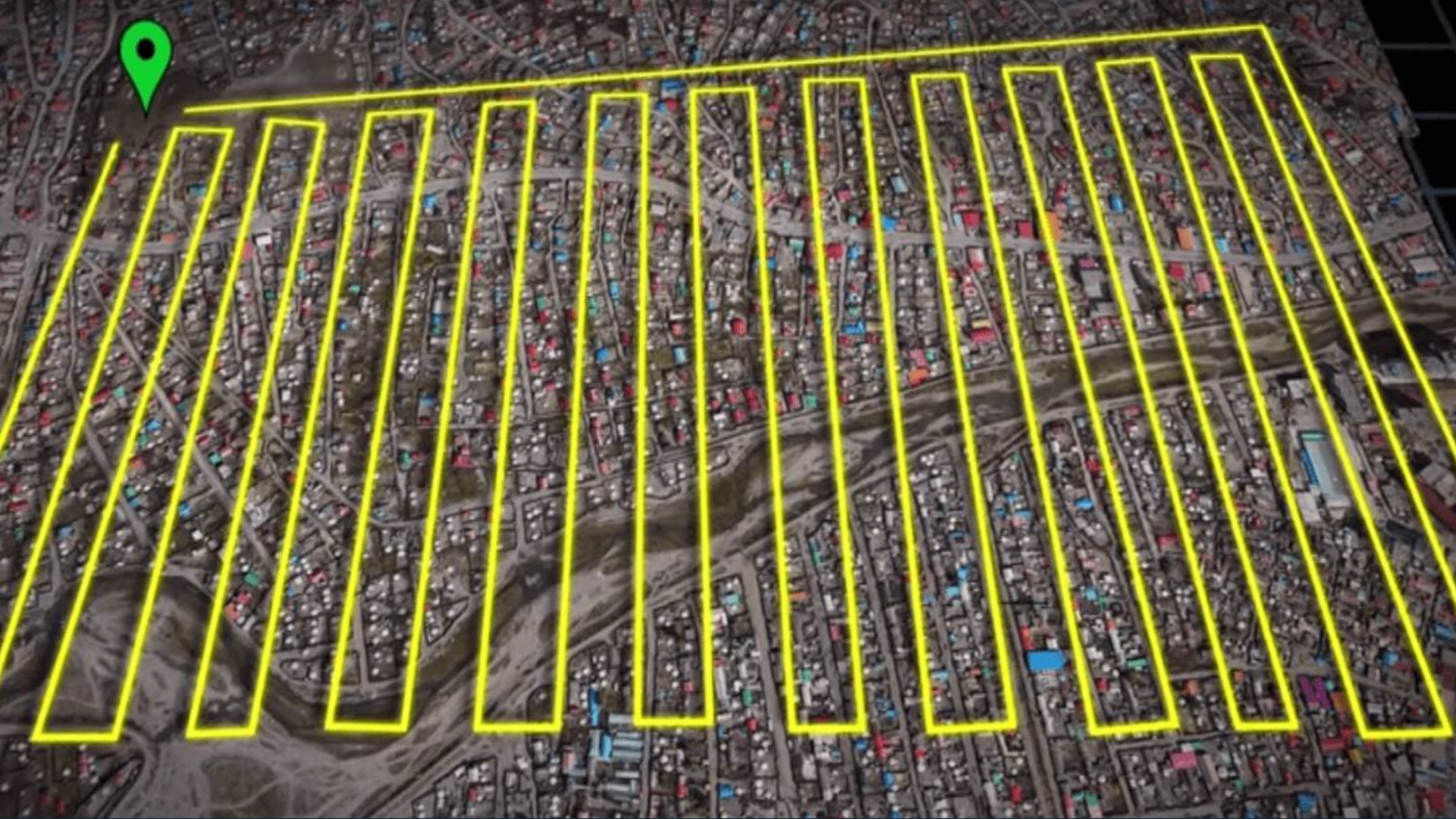
Used to mark the location of the victim in distraught to the operator.



Mode of Operation: Automatic Mode

1. Drobot navigates using ultrasonic sensors, path planning algorithm, and uses obstacle and collision avoidance algorithms to move without any human guidance
2. Uses altitude hold algorithm to ensure height is maintained
3. Identifies people in the video feed
4. After reaching the destination it releases basic amenities like food and water packets using hook and rope system
5. Alerts concerned authorities upon reaching back to the relief camp

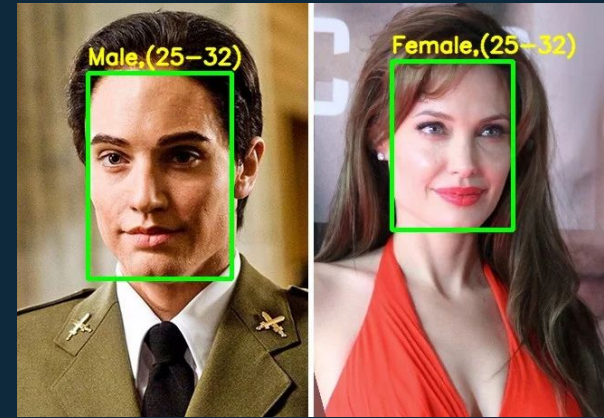






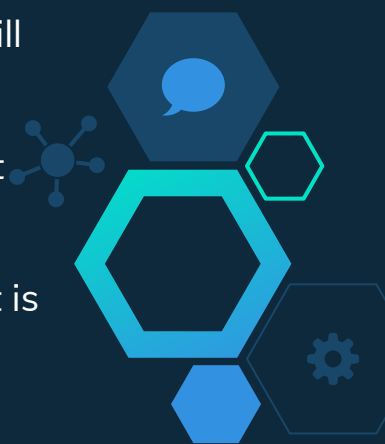
Color Coding and Medical Triage

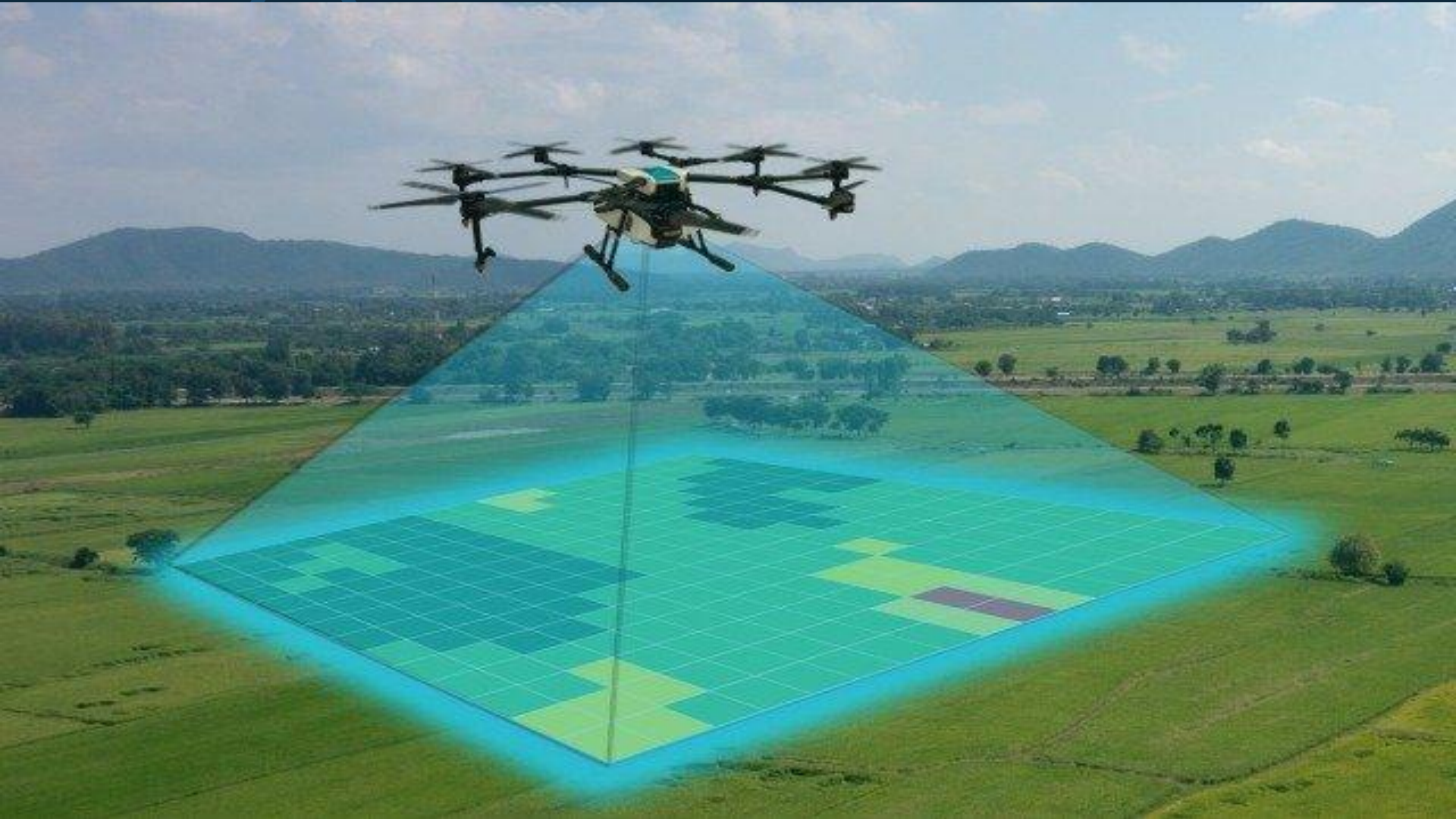
1. Creates a Matrix for Identifying regions requiring immediate help
2. Identifies number of people, age-groups, gender
3. Shares this information for efficient relief





Color Coding

- ◇ **Red tags** - (immediate) Cannot survive without immediate help but who have a chance of survival
 - ◇ **Yellow tags** - (observation) Their condition is stable for the moment and, they are not in immediate danger of death but will still need hospital care and would be treated immediately under normal circumstances
 - ◇ **Green tags** - (wait) are reserved for the "walking wounded" who will need medical care at some point, after more critical injuries have been treated
 - ◇ **White tags** - (dismiss) Minor injuries for whom a doctor's care is not required
 - ◇ **Black tags** - (expectant) Deceased and for those whose injuries are so extensive that they will not be able to survive given the care that is available
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Why Drobot?

1. Time plays a crucial role when it comes into an effective disaster management.
2. Drobot can be used to detect human presence using thermal imaging and save lives when a flood occurs.
3. It can also be used to send essentials to people who are struck . It is also weather resistant which allows it to function even in sub-zero temperatures.
4. Drone technology will revolutionize disaster response

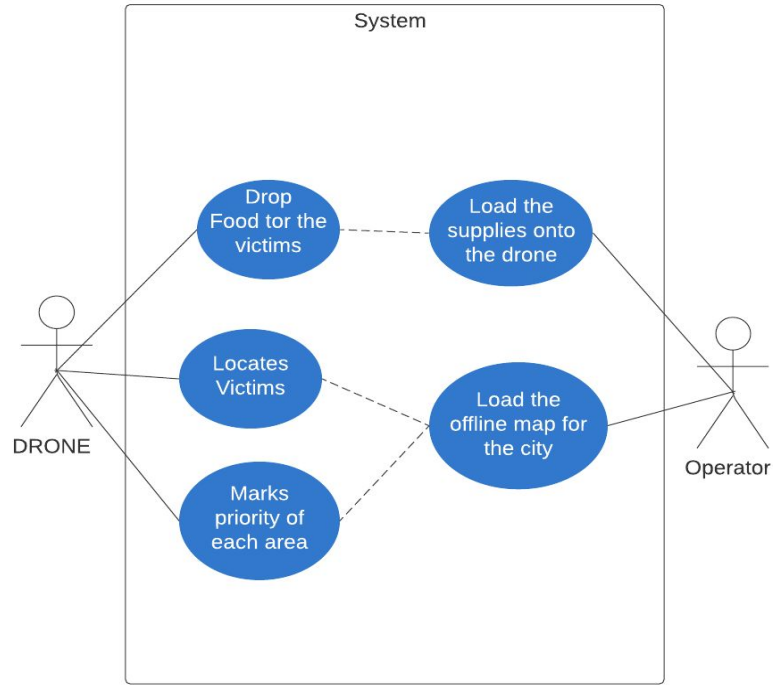


Use of IBM Cloud in Drobot

- ◇ Drobot uses IBM IoT Platform to store the location and amenities provided to victims.
- ◇ It uses Node-RED to visualise the data.



Use Case Diagram



Working



- ◇ Thermal imaging to detect human presence in the affected areas
- ◇ Once detected, the bot stores does on-board processing (CV) on video streaming to identify the degree to which the people are affected
- ◇ These bots can also be used to send basic-necessities to the people struck at a place until the rescue operation arrives





What we plan to work on

1. Using the concept of IoT to help the operator communicate more effectively with Drobot.
2. Use machine learning algorithms inside Drobot to predict any natural disaster by collecting weather reports
3. Using YOLO image processing algorithm to detect humans as well as navigate more efficiently by detecting obstacles.
4. Use renewable sources of energy to power Drobot.





Competition

1. Most of the drones presently depend upon an operator for controlling them, which can't be used if an internet connection is unavailable
2. Our autonomous drones marks places of high urgency and risk





Thank You!

